



PM Formalisation of Micro Food Processing Enterprises Scheme

DETAILED PROJECT REPORT FOR FIG PASTE



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Project At a Glance		
1	Name of the Project	Fig Paste
2	Name of the entrepreneur/FPO/SHG/Cooperative	
3	Nature of proposed project	Proprietorship/Company/ Partnership
4	Registered office	
5	Project site/location	
6	Names of Partner (if partnership)	
7	No of share holders (if company/FPC)	
8	Technical advisor	
9	Marketing advisor/partners	
10	Proposed project capacity	150 MT/annum (70, 80 & 90% capacity utilization in the 2nd, 3rd and 4th years' onwards respectively)
11	Raw materials	Fig Fruit
12	Major product outputs	Fig Paste
13	Total project cost (Lakhs)	28.24
	Land development, building & civil construction	4.44
	Machinery and equipments	17.75
	Utilities (Power & water facilities)	3
	Miscellaneous fixed assets	0.9
	Pre-operative expenses	0.90
	Contingencies	1.00
	Working capital margin	0.25
14	Working capital Management (In Lakhs)	
	Second Year	24.91
	Third Year	28.47
	Fourth Year	36.61
15	Means of Finance	
	Subsidy grant by MoFPI (max 10 lakhs)	9.3192
	Promoter's contribution (min 20%)	5.648
	Term loan (45%)	13.27
16	Debt-equity ratio	2.35 : 1
17	Profit after Depreciation, Interest & Tax	
	2nd year	145.89
	3rd year	168.74
	4th year	191.56
18	Average DSCR	19.14
	Benefit Cost Ratio	2.701
	Term Loan Payment	7 Years with 1 year grace period
	Pay Back Period for investment	2 Years

1 General Overview of Fig Production, Clusters, Post-Harvest Management and Value Addition in India

1.1 Introduction

Fig is a fruit of *Ficus carica*, an Asian species of flowering plant comes from mulberry family which is known as common fig. Figs generally are sweet in taste and has a chewy texture. Fresh figs are soft and perishable and at times to preserve it for longer duration of time it is dried. In India, Fig (*Ficus Carica*) is one of the traditional Mediterranean species. Fig fruit represents an important constituent of the diet, because of their nutritional and medicinal values. This type of diet is consider one of the healthiest and is associated with longevity. Figs are an excellent source of minerals, vitamins, polyphenols, and dietary fiber; they are fat and cholesterol-free and have a high antioxidant activity. Because of their low moisture content this ensures less change of microbial spoilage, large scale production and distribution possible. According to Vinson therefore JA, (1999) the major aims of fig fruit provide good quality products with good flavor, color, texture, and taste and make convenient fruit products.

1.2 Origin, Distribution and Production of Fig

Fig is the native fruit of Asia and Middle East. It has been sought out and cultivated since ancient times and is now widely grown throughout the world, both for its fruit and as an ornamental plant. Now a day demand for fig ingredients is increasing, because of which fig plant is cultivated throughout the world. Fig plant is one of the oldest plant cultivated by Humans.

Common Figs are generally found in rocky areas above the sea level of 1,700 meters and can be grown in poor soil. It is grown in the hilly areas of India as well, most commonly found in Pithoragarh, Kumaun hills. The common fig is indigenous to Western Asia and extending to northern India, but natural seedlings grow in most Mediterranean countries; it is cultivated in warm climates. The species has become naturalized in scattered locations in Asia and North America. As time went on, the fig growing territory stretched from Afghanistan to southern Germany and Canary Islands. The fig was one of the earliest fruit trees to be cultivated, and its cultivation spread in remote ages over all the districts around the Aegean Sea and throughout the Levant. The largest producers of fig in the world are Spain, Turkey, Egypt and Algeria accounting for almost 58% of total production. The total production of raw (fresh) fig in the world accounts for more than 1.05 million tons. In India fig farming is mostly done in Maharashtra, Gujarat, Uttar Pradesh, Karnataka and Tamil Nadu. The total area under fig cultivation is around 5600 hectares of land with a production of about 13,802 thousand tons, i.e. about 12.32 tons per hectare.

1.3 Varieties

There are many cultivated varieties in each class of figs. Some varieties are suited to warm areas and do not require pollination. Most popular among these are 'Celeste', 'Brown Turkey', 'Brunswick' and 'Marseilles'. At Saharanapur, India, 'Brown Turkey', 'Bangalore', 'Black Ischia' and 'Lucknow' are successfully grown. Around Bombay, there is only one variety, 'Poona'. Another type of fig tree, known as a Capri fig, produces inedible fig. In addition to the Capri fig, there are three other horticultural types of figs: Smyrna, White San Pedro, and Common. Smyrna type figs develop only when fertile seeds are present, and these seeds account for the generally excellent quality

and nutty flavor of fruit. Figs of the White San Pedro type combine the characteristics of both the Smyrna and the Common type on one tree. Common figs (such as the Dottato, Fraga and Brown Turkey) do not require pollination of flowers of either crop, the seeds in the mature fruit usually being hollow. It can produce fertile seeds if the flowers are pollinated.

1.4 Health benefits and Nutritional Information

Fresh Figs are delicious and nutritious as they are rich in calorie, protein, calcium and iron. Fig has nutritive index of 11, as against 9 for apple and 6 for raisin. The bulk of the fruit (about 80%) is consumed in the dried form. The fruit is also credited with laxative and medicinal properties and is being applied on boils and for other skin infections.

Figs are rich in nutrients while being relatively low in calories, making them a great addition to a healthy diet. Figs also contain significant amount of calcium, potassium, phosphorus, iron and small amounts of a wide variety of nutrients, but they are particularly rich in copper and vitamin B₆. Copper is vital mineral that is involved in several bodily processes, including metabolism and energy production, as well as the formation of blood cells, connective tissues, and neurotransmitters. Vitamin B₆ is a key vitamin necessary to help your body break down dietary protein and create new proteins. It also plays an important role in brain health.

Nutritional value per 100 g

Nutritional parameters	Values
Calories	74 Kcal
Protein	0.75 gram
Fat	0.30 gram

Carbohydrates	19.18 gram
Fiber	2.9 gram
Copper	0.070 mg
Magnesium	17 mg
Potassium	232 mg
Calcium	35 mg
Sodium	1 mg
Iron	0.37 mg
Zinc	0.15 mg
Riboflavin	0.050 mg
Thiamine	0.060 mg
Vitamin B ₆	0.113 mg
Vitamin K	4.7 µg
Vitamin A	142 IU
Vitamin C	2 mg
Vitamin E	0.11 mg
Niacin	0.400 mg

Figs have many potential health benefits, including promoting digestive and heart health, along with potentially helping manage blood sugar levels. Research also depicted that figs have antioxidant, anticancer, anti-inflammatory, fat-lowering and cell-protective properties.

i. Promote digestive health:

Fig is one of the best fruits to replenish and soothe the intestines. It acts as a natural laxative as it is loaded with a good amount of soluble fiber. Evidence strongly proves that fig dense in fiber content can promote normal bowel function, add bulk to stool and ease the bowel movement averting constipation and serving as a prebiotic and serves as a natural remedy to treat digestive disorders like stomach flu.

ii. Regulates Blood Pressure:

Figs may improve blood pressure and blood fat levels, which can help improve your vascular health and decrease your risk of heart disease. The abundance of potassium in fig helps in regulating high blood pressure. Potassium is a vital mineral that aids the body in controlling blood pressure as it facilitates to refute negative impacts of sodium. The goodness of potassium in figs helps to stimulate the functioning of muscles and nerves, balances the fluid in the system and maintains the electrolyte balance. Managing blood pressure can help in dilating blood vessels, improving blood circulation, relaxes and can also ease stress. Thus figs are the best fruit to add on to a high blood pressure diet.

iii. Promotes Heart Health

Figs lower the level of triglycerides in the bloodstream and avert the risk of heart disease. Figs are rich in soluble fiber pectin clears away the clogged cholesterol and eliminates it out of the body through the excretory system. In addition, high on antioxidants and potassium dried figs regulate blood pressure, scavenges free radicals from the body and prevent blockage of arteries and lowers the risk of cardiovascular diseases.

iii. Help manage blood sugar levels:

Fig fruit extract drink has lower glycemic index (GI) than other fruit extract juices. Because of lower glycemic index, it control the blood sugar level. Fig may control diabetes.

iv. Treat Piles

The natural laxative property of figs aids in lowering the pressure on the rectum thereby easing the haemorrhoids. As per the report published in Evidence-Based Complementary and Alternative Medicinal Journal, figs are used as a traditional remedy for treating haemorrhoids due to its laxative and antispasmodic properties.

v. Stronger Bones

Figs are heaped with a rich array of essential minerals and vitamins which play a key role in strengthening bones and lowers the risk of osteoporosis. Being one of the foods rich in calcium and phosphorus it promotes the formation of bones and stimuli regrowth of bones if there is any injury or deterioration of bones. A serving of fresh stewed figs offers you with 180 mg of calcium and vital vitamins C and K necessary for strengthening the bone density.

vi. Treats Alzheimer 's disease

Evidence strongly supports that a diet abundant in figs helps in treating neurodegenerative conditions like Alzheimer's and eases neuro inflammation. Fig is loaded with umpteen amounts of dietary fiber, copper, zinc, magnesium, potassium, vitamin K and antioxidants promote memory, reduce anxiety and improves the learning skills in Alzheimer's patients.

vii. Prevents Age related Macular Degeneration

Fig is a valued fruit as it assists in preventing age related macular degeneration, a major reason behind vision loss in elderly people. Regular intake promotes healthy vision in all age groups.

viii. Treats Insomnia

Dry fig is highly beneficial for people suffering from insomnia and it is one of the sleep inducing foods. The goodness of tryptophan promotes sound sleep by improving blood circulation in the body.

ix. Respiratory Problems

The richness of essential nutrients like protein, carbohydrate, fibre, vitamins A, C and minerals iron, calcium in fig hydrates the respiratory system and naturally clears the phlegm, soothes the sore throat, reduces the cough and other lung obstructions.

x. Dental Health

The presence of phenolic compounds in fig exhibits anti-caries activity and thwarts off bacteria causing dental infection. The flavonoids and phytochemicals in fig fruit exhibit potent antibacterial activities which reduce bacterial infections, guard gums, teeth and promotes overall dental health.

xi. Promote healthy skin: Dried fig fruit extract cream effective at treating the symptoms of dermatitis.

1.5 Cultivation, Bearing & Post Harvest management:-

The fig plant is a bush or small tree, from 1 meter to 10-12 meters high, with broad, rough, deciduous leaves that are deeply lobed or nearly entire. The leaves and stems exude a white latex when broken. The fig fruit is unique. Unlike most 'fruit' in which the structure is matured ovary tissue, the fig's edible structure is actually a stem tissue. Fig fruits, known as syconia, are borne singly or in pairs above the scars of fallen

leaves or in axile of leaves of the present season. At maturity, the interior of the fig contains only the remains of the flower structure, including the small gritty structures commonly called 'seed', which are the unfertilized ovaries that had failed to develop. They impart resin like flavor associated with fig. Flowers are staminate (male) or pistillate (female) and enclosed within the inflorescence structure.

Cultivation and Bearing:-

The fruits may be picked from the tree or gathered normally or by mechanical sweepers after they fall to the ground. 'Brunswick' is so tender it must be picked when slightly unripe in order to be firm enough for processing. Workers must wear gloves and protective clothing because of the latex. Harvested fruits are spread out in the shade for a day so that the latex will dry a little. Then they are transported to processing plants in wooden boxes holding 10-15 kg. In India, a fig tree bears 180 to 360 fruits per year.

Post-harvest management:-

The fig fruit is perishable in nature and is not suitable for transport over long distances. When the fruit is intended for distant markets, then it should be harvested slightly before the full maturity. Fresh fruits that are ripe can be sold in the local markets. The fruits that are picked at optimum maturity stage are cooled within 6 hours of harvest and can be kept for 20 days at 1°C. Similarly, the fruits can be preserved for 7 days at 10°C and just for 2 or 3 days at 20°C. At 40° to 43°F (4.44°- 6.11°C) and 75% relative humidity, figs remain in good condition for 8 days but have a shelf life of only 1 to 2 days when removed from storage. They remain in good condition for 30 days when stored at 32° to 35° F (0°- 1.67° C). If frozen whole, they can be maintained for several months.

Excess produce can be stored by dehydration of the moisture content to about 10-12%. For storage the fruits are treated

with sulphur fumes @ 4 g per 10 kg of fruits and then dried at a temperature of 60°C until the moisture is reduced to about 12%. Dehydration controls the browning of the fruit, improves fruit texture and reduces infestation. Traditional sun drying is also practiced in some parts of the world, but this method has a high risk of infestation by pests and other pathogens.

Fig trees are prone to attack by nematodes (especially *Meloidogyne* spp.) and, in the tropics, have been traditionally planted close to a wall or building so that the roots can go underneath and escape damage. But control is possible with proper application of Nematicides.

In India, a stem-borer, *Batocera rufomaculata*, feeds on the branches and may kill the tree. There are also coleopterous insects of the genera *Epitrix* and *Colaspis* that perforate and severely damage the leaves and shoots. Scale insects include *Asterolecanium* sp. which attacks the bark of trees weakened by excessive humidity or prolonged drought. A common and widespread problem is leaf rust caused by *Cerotelium fici*; bringing about premature leaf fall and reducing yields. It is most prevalent in rainy seasons. Leaf spot results from infection by *Cylindrocladium scoparium* or *Cercospora fici*. Fig mosaic is caused by a virus and is incurable. Affected trees must be destroyed. The dried fruit beetle, or sour bug, *Carpophilus* spp., enters the fruit through the eye and leads to souring and smut caused by *Aspergillus niger*. This fungus may attack ripening fruits. The latex of the unripe fruits and of any part of the tree may be severely irritating to the skin if not removed promptly. It is an occupational hazard not only to fig harvesters and packers but also to workers in food industries, and to those who employ the latex to treat skin diseases.

1.6 Processing & Value Addition:-

The fresh fruits have limited shelf life; therefore, it is necessary to process fresh fruits into different value added products to increase its availability over an extended period and to stabilize the price during the glut season. Commercially, figs are peeled by immersion for 1 minute in boiling lye water or a boiling solution of sodium bicarbonate. In warm, humid climates, figs are generally eaten fresh and raw without peeling, and they are often served with cream and sugar. Peeled or unpeeled, the fruits may be merely stewed or cooked in various ways, as in pies, puddings, cakes, bread or other bakery products, or added to ice cream mix. Owners preserve the whole fruits in sugar syrup. It can also be used for the preparation of mixed fruit jam, fig paste, fig powder, fig marmalade, fig squash can be used as a beverage after dilution with water in 1:3 ratio; Fig ready to serve beverage can be used as a thirst quencher.

Fig Paste is a thick liquid made from boiling figs in water. It's ideal for desserts, pastries, pancakes, and hot beverages. It is incredibly sweet, making it a great substitute for sugar. Since it needs minimal storage, the paste is preferable to storing massive wall of dried figs. Fig paste has been traditionally used in fig cookies, energy and health food bars, as well as spreads, sauces, jams and fruit fillings. It can provide a natural sweetness, pleasing mouth feel, and adds fiber and calcium to your manufactured item. Fig paste is very dense, and can be difficult to work into flow able solution without a powerful mixer.

Fig paste is fortified with Soy Protein isolate. As Soy Protein Isolate improved their functional and Nutritional Characteristics. Soybean has been identified as inexpensive high protein resource. Soy protein isolates (SPI) has considerable potential for use as protein supplements because of its high protein content (90% protein) and good balance of amino acids that complement the amino acid pattern; therefore, it is recommended for dietary

Supplements or protein fortification in many food products, which may solve protein-malnutrition in developing countries. In 1998, USFDA approved soy protein for health claims, because of natural phytochemicals such as isoflavones were found to function as antioxidants to combat oxidative degradation that could lead to diseases inside the body.

2. Model Fortified Fig Paste Processing Under FME Scheme

2.1 Location of the Proposed Project and Land

The entrepreneur must provide description of the proposed location, site of the project, distance from the targeted local and distant markets; and the reasons/advantages thereof i.e. in terms of raw materials availability, market accessibility, logistics support, basic infrastructure availability etc.

The ideal locations for establishment of exclusive Fortified Fig paste processing unit are in the production clusters of Fig growing states such as Maharashtra, Gujarat, Uttar Pradesh, Karnataka, Tamil Nadu, Pithoragarh and Kumaun hills where adequate quantities of surplus raw materials can be available for processing.

2.2 Installed Capacity of the Fortified Fig Paste Processing Unit

The maximum installed capacity of the fortified fig paste manufacturing unit in the present model project is proposed as 150 tonnes/annum or 500 kg/day Fortified Fig Paste. The unit is assumed to operate 300 days/annum @ 8-10 hrs/day. The 1st year is assumed to be construction/expansion period of the project; and in the 2nd year 70 percent capacity, 3rd year 80 percent capacity and 4th year onwards 90 percent capacity utilization is assumed in this model project.

2.3 Raw Material Requirements for the Unit

A sustainable food processing unit must ensure maximum capacity utilization and thus requires an operation of minimum 280-300 days per year to get reasonable profit. Therefore, ensuring uninterrupted raw

materials supply requires maintenance of adequate raw material inventory. The processor must have linkage with producer organizations preferably FPCs through legal contract to get adequate quantity and quality of raw materials which otherwise get spoiled. In the fig paste manufacturing project, the unit requires 350 kg/day, 400 kg/day and 450 kg/day raw ripened fig at 70, 80 and 90 percent capacity utilization, respectively. The Mature Fig must be plucked from plant; and then stored below 6°C temperature.

2.4 Manufacturing process of the Fortified Fig Paste

Selection of Fig Fruit

(Mature fig fruits with bright color and characteristic flavor will be used)



Sorting

(Diseased, damaged or decayed fruits are rejected or trimmed)



***Washing and cleaning**

(rinsed with chlorine dioxide solution (10-100ppm))



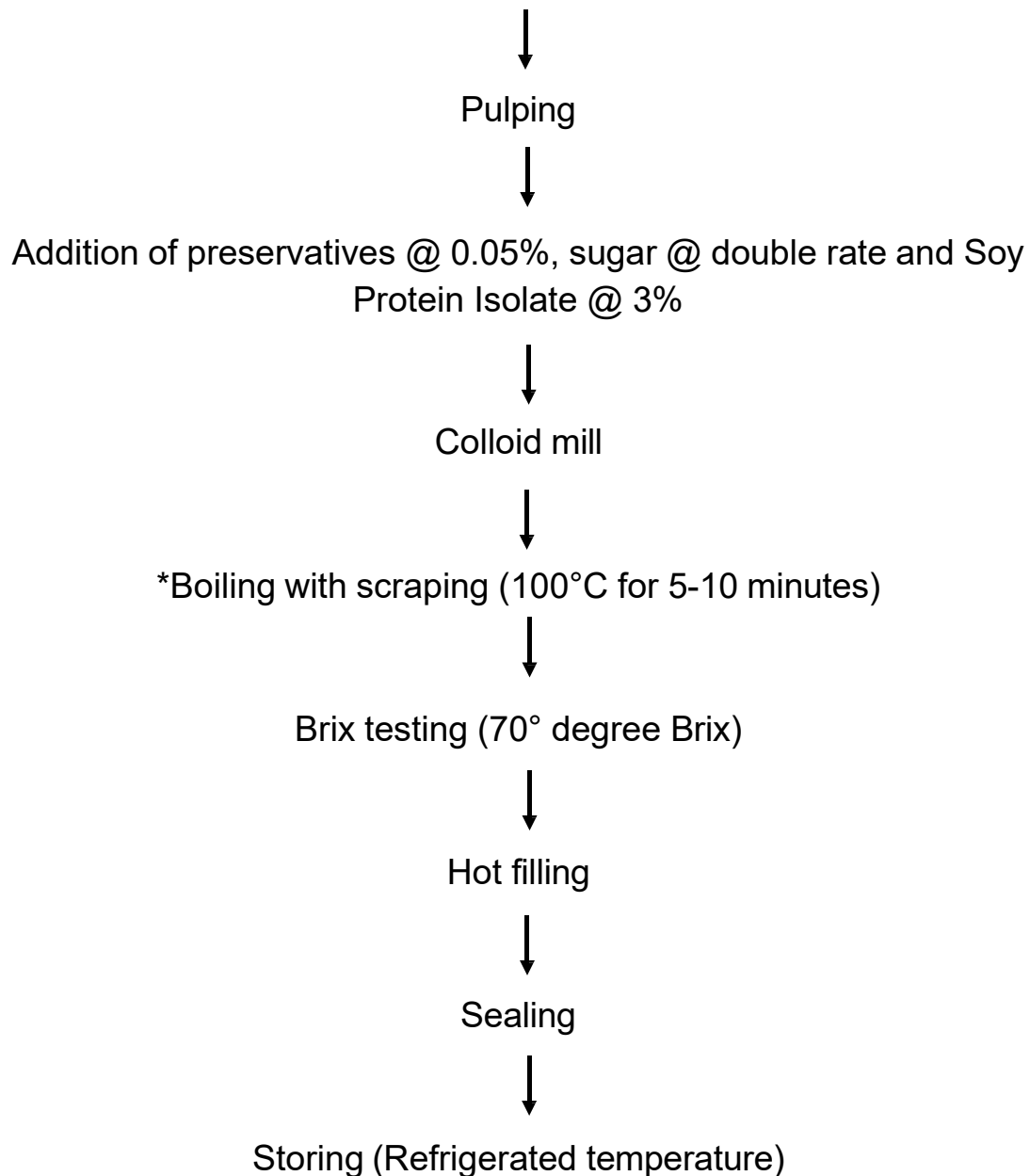
***Aflatoxin check under BLAK-RAY UV lamp**



***Metal detection**



Grinding



*Critical Control Point

Recommended Critical Control Point should be established.

Selection of fig fruit: Mature fig fruits with bright color and characteristic flavor will be used for the preparation of different processed products. The variety and maturity of fruit influence the flavor and keeping quality of its paste.

Sorting and Grading: Diseased, damaged or decayed fruits are rejected or trimmed.

Cleaning and washing: Dirt are removed by washing with water, rinsed with chlorine dioxide solution (10-100ppm) and again rinsed with water in Fruit bubble washer.

Aflatoxin check under UV lamp: Fig is inspected under the BLAK-RAY UV lamp for a characteristic bright greenish yellow (BGY) fluorescence in broken and damaged fruit. The test takes 5 minutes or less. If the fluorescence is observed, aflatoxin may be present.

Metal detection: Metal detection in fig fruit detected by metal detector.

Grinding: Fig fruits are grinded in fruit grinding machine.

Pulping: Pulp is extracted from grinded fig fruit by crushing and pressing them in fruit pulper.

Addition of Soy Protein Isolates: Soy Protein Isolate is added at 3 % level.

Addition of preservative and sugar: Preservative is added to prevent the contamination. Sulphur dioxide is added at rate of 0.05 % (0.5gm/kg). Sugar is added at double rate (1 kg sugar is added in 500 gm fig fruit).

Colloid mill: Boiled mixture is processed under Colloid mill to make smooth and homogeneous paste.

Boiling: Mixture of fig fruit, sugar and preservatives is boiled at 100°C for 5-10 min to soften the fig fruit. Boiling allowing soluble fibers to dissolve.

Brix Testing: Brix of Fortified Fig paste is measured by Brix Optical Refractometer. Brix is measured in Degree Brix (°Brix). Brix value of Fruit paste is 70°.

Hot Filling: Hot filling is the process of sterilizing the product and inside of a bottle or container and cap or closure in order to ensure the safety of the product and prolong its shelf life. Hot Filling is done at temperature 70-80°C. Hot filling is done by Paste filling machine. Bottles are thoroughly with hot water and steam and filled with pasteurized Paste. 1.5 to 2.5 cm head space is kept. Sealed either with crown cork (by crown corking machine) or with caps (by capping machine) Bottled are cooled and stored at ambient temperature.

Sealing: Packaged product is sealed by Continuous sealing machine

Packaging: Fig paste is packed in polyethylene pouches and corrugated fiber cases which are lined with polyethylene liner that completely covers the fig paste block when encased in container, Glass bottles, PET, and Metal can.

Storage: Recommended storage temperature should be 4-10°C; < 55 % Humidity.

2.5 Market Demand and Supply for Fortified Fig Paste

Fig Value-added product is segment on the basis of application, form and region. On the basis of application. Fig Value-added product market is segmented into food and cosmetic segments. The food segment is further divided into sub segments that is bakery, confectionary and dairy products. Cosmetic segment is utilized in the form of face wash, face moisturizer and face cream. Among all these segment food segment is expected to grow enormously in the coming future. The demand for Fig Value-added product is more due to the ease of availability of product to the consumer. On the basis of form the fig ingredient market is segmented into powder and paste. Fig paste has special properties which provide various health benefits such

as anti-oxidant properties, acts as a superb prebiotic and has the ability to maintain good digestive system. On the basis of region fig paste market is segmented into North America, Latin America, Western Europe, Eastern Europe, Asia Pacific, MEA and Japan. Among these segment MEA is expected to have the major market share globally, as it is the largest producer and consumer of fig ingredient. In terms of revenue Asia Pacific may be the second prominent contributor in the fig value-added product including fig paste market.

Research have shown that fig paste helps in the nourishment of the intestine as it is a natural prebiotic and act as a natural laxative. Moreover, the market is also driven by the increasing awareness among the consumers about the health benefits associated with fig paste. Fig paste is used as treatment for diabetes, cough, piles, asthma, whooping cough and bronchitis. Although fig paste market is growing at a steady pace yet it may have some restrain such as consuming too much fig is not recommended by the doctors as too much consumption may cause diarrhea. Furthermore high content of sugar may also cause tooth decay and chemical present in the fig may also cause allergy to some people.

2.6 Marketing Strategy for Fig Products

The increasing urbanization and income offers huge scope for marketing of fruit based products. Urban organized platforms such as departmental stores, malls, super markets can be attractive platforms to sell well packaged and branded Fig based products.

2.7 Detailed project Assumptions

This model DPR for Fortified fig paste unit is basically prepared as a template based on certain assumptions that may vary with capacity,

location, raw materials availability etc. An entrepreneur can use this model DPR format and modify as per requirement and suitability. The assumptions made in preparation of this particular DPR are given in This DPR assumes expansion of existing fruit processing unit by adding new paste manufacturing line. Therefore, land and civil infrastructures are assumed as already available with the entrepreneurs.

- Herewith in this DPR, we have considered the assumptions as listed below in the tables of different costs, which may vary as per region, seasons and machinery designs and supplier.
 1. Fig cost considered @ Rs.150/-per kg.
 2. Sugar cost considered @ Rs. 32/-kg.
 3. 1 kg fig will produce 80% recovery.
 4. Pulping will done manually as production is very small.
 5. 1 Batch cooking will take approximately 1.5 hrs.
 6. 1 Batch size is approximately 100 kg.
 7. No. of hours per day are approximately 10 hours.
 8. Batch yield is 95%

Parameter	Assumption	
Capacity of the Fortified Fig Paste Unit	150	MT/annum
Utilization of capacity	1st Year Implementation, 70% in second, 80% in third and 90% in fourth year onwards	
Working days per year	300	days
Working hours per day	10	hours
Interest on term and working capital loan	12	
Repayment period	Seven year with one year grace period is considered.	
Average prices of raw material	Rs. 150 per Kg	
Average sale prices of Fortified Fig Paste/kg	280	Rs/kg
Pulp extraction	85	
Pulp processing	0.85 Kg Fig Fruit /Kg Fortified Fig Paste	

2.8 Fixed Capital Investment

2.8.1 Machinery and Equipment

Sr No.	Equipment	Capacity	Quantity	Price (Rs. In Lacs)
1	Cold store sq. meter	1500 kgs	1	3.5
2	Washing tank	200 Liter	1	0.4
3	Fruit pulper	100 kg/hr	1	0.2
4	Fruit grinding machine	100 kg/hr	1	0.3
5	Thermic fluid kettle with scraper	150 liter	1	1.8
6	Colloid mill	Continuous	1	1.3
7	Finished product storage tank	150liter	1	0.4
8	Paste filling machine	suitable	1	1.1
9	Cont.sealing machine	suitable	1	0.35
10	Weighing balance	suitable	1	0.2
11	Accessories	lot		1.5
12	Contingency	Standard	1	0.9
13	Water + Power			3
14	Fixed Assets			0.9
15	Pre-operative cost			0.9
16	Contingency			1
				17.75

2.8.2 Other costs:-

Utilities and Fittings:-

Utilities and Fittings		
1.	Water	Rs. 3 Lacs total
2.	Power	

Other Fixed Assests:

Other Fixed Assets

1. Furniture & Fixtures	Rs. 0.9 lac total
2. Plastic tray capacity	
3. Electrical fittings	

Pre-operative expenses

Pre-operative Expenses	
Legal expenses, Start-up expenses, Establishment cost, consultancy fees, trials and others.	0.9 LAC
Total preoperative expenses	0.9 LAC

Contingency cost to be added as approx.1 Lac.

So total startup cost at own land & Premise may be somewhat similar to 28.24 lacs. This is according to survey done at X location india. This may vary on location, situation and design change over.

2.9 Working Capital requirements

Particulars	Period	Year 2 (70%-70 MT)	Year 3(80%-80MT)	Year 4 (90%-90 MT)
Raw material stock	7 days	3.05	3.49	4.49
Work in progress	15 days	5.79	6.62	8.51
Packing material	15 days	0.60	0.69	0.88
Finished goods' stock	15 days	7.61	8.70	11.19
Receivables	30 days	15.22	17.40	22.37
Working expenses	30 days	0.94	1.07	1.38
Total current assets		33.22	37.96	48.81
Trade creditors		0.00	0.00	0.00
Working capital gap		33.22	37.96	48.81
Margin money (25%)		8.30	9.49	12.20
Bank finance		24.91	28.47	36.61

2.10 Total project Cost and Means of Finances

Particulars	Amount in Lakhs
i. Land and building (20 x 32 x 12 ft - LxBxH)	4.44
ii. Plant and machinery	17.75
iii. Utilities & Fittings	3
iv. Other Fixed assets	0.9
v. Pre-operative expenses	0.90
vi. Contingencies	1.00
vii. Working capital margin	0.25
Total project cost (i to vii)	28.24
Net Sale per Day in Lacs	0.28
Net Profit Per Annum @300 working days	260.15
Payback Period	Less than 1 year

2.11 Manpower Requirements

Total Monthly Salary (Rs.)	No	Wages	Total Monthly	Total Annualy
Supervisor (can be the owner)	1	18000	18000	216000
Technician	1	14000	14000	168000
Semi skilled	2	7600	15200	182400
Helper	1	5500	5500	66000
Sales man	1	8000	8000	96000
			60700	728400

2.12 Expenditure, Revenue and Profitability Analysis

	Particulars	1st Year	2nd Year	3rd Year	4 th Year	5th year	6th year
A	Total Installed Capacity (MT)	45 MT Fig/Annum	105	120	135	135	135
	Capacity utilization (%)	Under Const.	70%	80%	90%	90%	90%
B	Expenditure (Rs. in Lakh)	0					
	Raw Fig(Av. Price @ Rs. 150/Kg)	0.00	63.00	72.00	81.00	81.00	81.00
	Sugar @ 32/kg	0.00	19.15	21.89	24.62	24.62	24.62
	Other ingredients	0.00	4.73	5.40	6.08	6.08	6.08
	Packaging materials (Rs 8 per Kg)	0.00	8.40	9.60	10.80	10.80	10.80
	Utilities (Electricity, Fuel)	0.00	1.66	1.90	2.14	2.14	2.14
	Salaries (1st yr only manager's salary)	2.16	7.28	7.28	7.28	7.28	7.28
	Repair & maintenance	0.00	0.70	0.80	0.90	0.90	0.90
	Insurance	0.30	0.30	0.30	0.30	0.30	0.30
	Miscellaneous expenses	0.50	2.30	2.30	2.30	2.30	2.30
	Total Expenditure	2.96	107.53	121.47	135.42	135.42	135.42
C	Total Sales Revenue (Rs. in Lakh)	0.00	294.00	336.00	378.00	378.00	378.00
	Sale of Fortified Fig paste (Av. Sale Price @ Rs. 280/kg)	0.00	294.00	336.00	378.00	378.00	378.00
D	PBDIT (Total exp.-Total sales rev.) (Rs. in Lakh)/Cash Inflows	-2.96	186.47	214.53	242.58	242.58	242.58
	Depreciation on civil works @ 5% per annum	0.22	0.21	0.20	0.19	0.18	0.17
	Depreciation on machinery @ 10% per annum	1.78	1.60	1.44	1.29	1.16	1.05
	Depreciation on other fixed assets @ 15% per annum	0.59	0.50	0.42	0.36	0.31	0.26
	Interest on term loan @ 12%	1.47	1.47	1.23	0.99	0.75	0.51
	Interest on working capital @ 12%	0.00	2.99	3.42	4.39	4.39	4.39
E	Profit after depreciation and Interest (Rs. in Lakh)	-7.01	182.70	211.24	239.74	240.18	240.59
F	Tax (assumed 30%) (Rs. in Lakh)	0.00	54.81	63.37	71.92	72.05	72.18
G	Profit after depreciation, Interest & Tax (Rs. in Lakh)	-7.01	127.89	147.86	167.82	168.12	168.41
H	Surplus available for repayment (PBDIT-Interest on working capital-Tax) (Rs. in Lakh)	-2.90	55.00	64.30	73.30	73.00	72.80
I	Coverage available (Rs. in Lakh)	-2.90	55.00	64.30	73.30	73.00	72.80
J	Total Debt Outgo (Rs. in Lakh)	1.47	3.39	3.15	2.91	2.67	2.43
K	Debt Service Coverage Ratio (DSCR)	-1.97	16.22	20.41	25.19	27.34	29.96
	Average DSCR	19.53					
L	Cash accruals (PBDIT- Interest-Tax) (Rs. in Lakh)	-4.43	130.20	149.93	169.66	169.77	169.89
M	Payback Period						
	(on Rs. 30 Lakhs initial investment)	2 Years					

2.13 Repayment Schedule

	Amount in Lakhs								
Year	Outstanding loan at start of yr.	Disbursement	Total outstanding Loan	Surplus for repayment	Interest payment	Repayment of principal	Total Outgo	o/s Loan at the end of the yr.	Balance left
1	0	14	14	-2.9	1.47	0	1.47	14	-1.43
2	14		14	55	1.47	1.92	3.39	12	51.61
3	12		12	64.3	1.23	1.92	3.15	10	61.15
4	10		10	73.3	0.99	1.92	2.91	8	70.39
5	8		8	73	0.75	1.92	2.67	6	70.33
6	6		6	72.8	0.51	1.92	2.43	4	70.37
7	4		4	72.77	0.27	1.92	2.19	2	70.58
8	2		2	72.76	0.03	1.92	1.95	0	70.81

2.14 Asset's Depreciation

Assets' Depreciation (Down Value Method)							Amounts in Lakhs	
Particulars	1st Year	2nd year	3 rd year	4th year	5th year	6th year	7th year	8th year
Civil works	4.44	4.21	4.00	3.80	3.61	3.43	3.26	3.10
Depreciation	0.22	0.21	0.20	0.19	0.18	0.17	0.16	0.15
Depreciated value	4.21	4.00	3.80	3.61	3.43	3.26	3.10	2.94
Plant & Machinery	17.75	15.97	14.37	12.93	11.64	10.48	9.43	8.48
Depreciation	1.77	1.59	1.43	1.29	1.16	1.04	0.94	0.84
Depreciated value	15.97	14.37	12.93	11.64	10.48	9.43	8.48	7.64
Other Fixed Assets	3.9	3.31	2.81	2.39	2.03	1.73	1.47	1.25
Depreciation	0.58	0.49	0.42	0.35	0.30	0.25	0.22	0.18
Depreciated value	3.31	2.81	2.39	2.03	1.73	1.47	1.25	1.06

All Assets	26.09	23.50	21.20	19.14	17.29	15.64	14.16	12.84
Depreciation	2.58	2.30	2.06	1.84	1.65	1.47	1.32	1.19
Depreciated value	23.50	21.20	19.14	17.29	15.64	14.16	12.84	11.64

2.15 Financial Assessment of the project

Benefit Cost Ratio (BCR) and Net Present Worth (NPW)

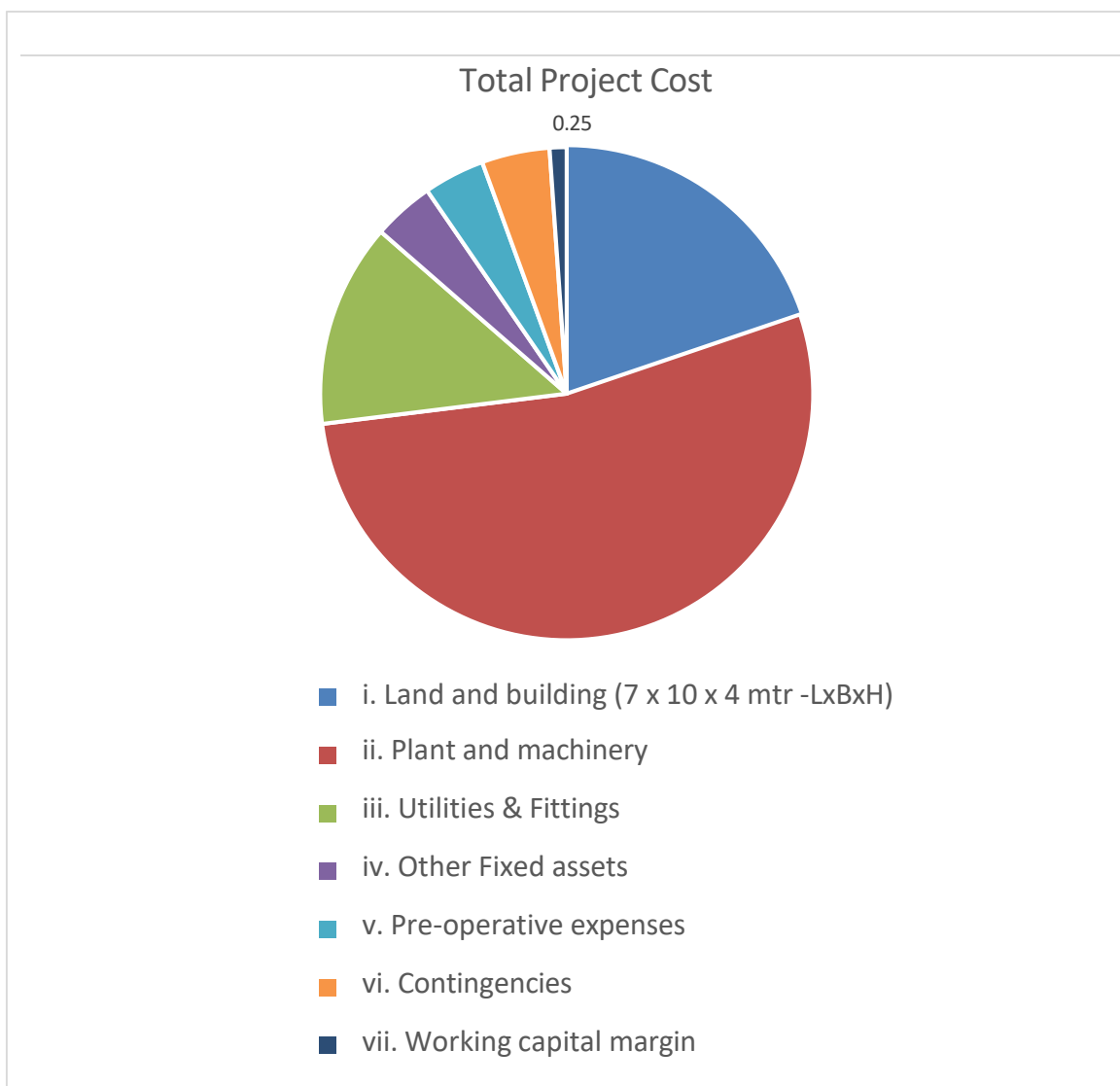
Particulars	1st Year	2nd year	3 rd year	4th year	5th year	6th year	7th year	8th year	
Capital cost (Rs. in Lakh)	28.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Recurring cost (Rs. in Lakh)	2.96	107.53	121.47	135.42	135.42	135.42	135.42	135.42	
Total cost (Rs. in Lakh)	31.20	107.53	121.47	135.42	135.42	135.42	135.42	135.42	937.31
Benefit (Rs. in Lakh)	0.00	294.00	336.00	378.00	378.00	378.00	378.00	378.00	
Total Depreciated value of all assets (Rs. in Lakh)								11.64	
Total benefits (Rs. in Lakh)	0.00	294.00	336.00	378.00	378.00	378.00	378.00	389.65	2531.65
Benefit-Cost Ratio (BCR): (Highly Profitable project)	2.70								
Net Present Worth (NPW): 828.34									

2.16 Break even analysis

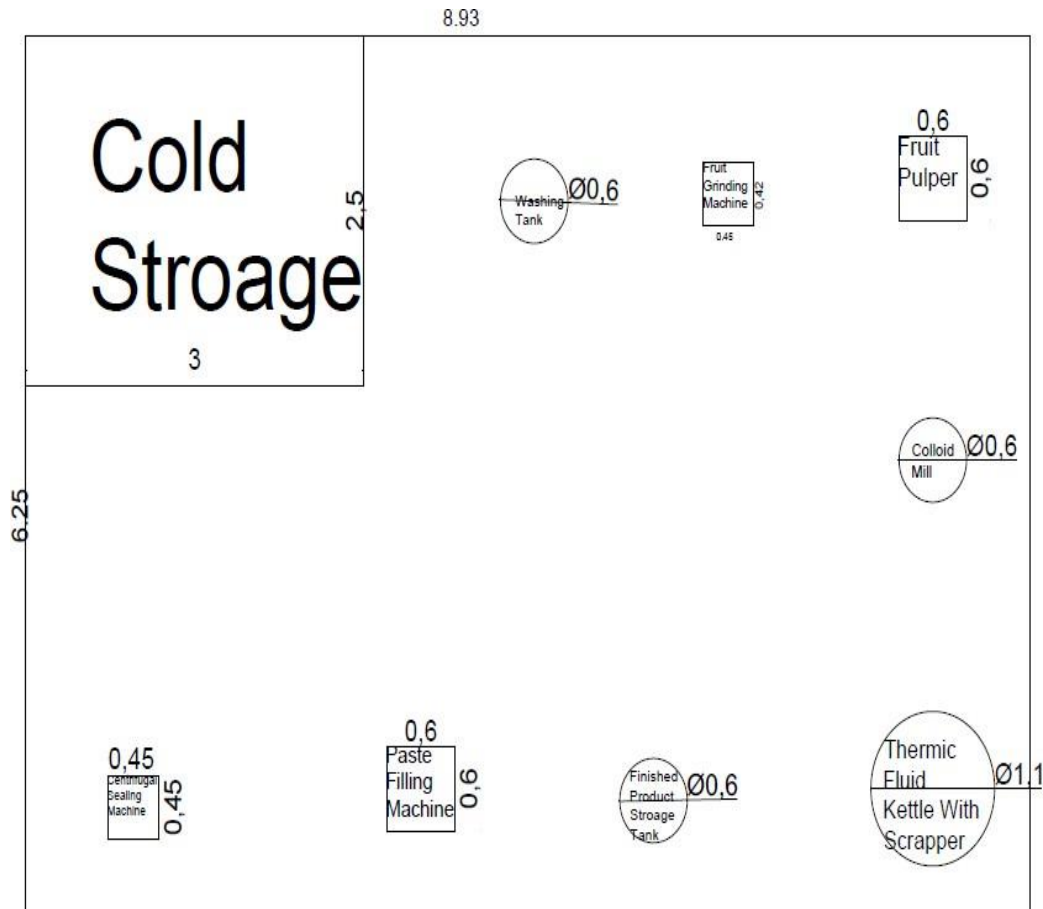
Break even analysis indicates costs-volume profit relations in the short run. This is the level at which, the firm is in no loss no profit situation.

Particulars	1st Year	2nd year	3 rd year	4th year	5th year	6th year	7th year	8th year
Capacity utilization (%)	Under Const.	70%	80%	90%	90%	90%	90%	90%
Production MT/Annum		105	120	135	135	135	135	135
Fixed Cost (Rs. in Lakh)								
Permanent staff salaries	7.28	7.28	7.28	7.28	7.28	7.28	7.28	7.28
Depreciation on building @ 5% per annum	0.22	0.21	0.20	0.19	0.18	0.17	0.16	0.15
Depreciation on machinery @ 10% per annum	1.77	1.69	1.52	1.37	1.23	1.11	1.00	0.90
Depreciation on other fixed assets @ 15% per annum	0.58	0.39	0.33	0.28	0.24	0.20	0.17	0.15
Interest on term loan	1.47	1.47	1.23	0.99	0.75	0.51	0.27	0.03
Insurance	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Total Fixed Cost (Rs. in Lakh)	11.63	11.35	10.87	10.42	9.99	9.58	9.19	8.81
Sales Revenue (Rs. in Lakh)	0	294	336	378	378	378	378	378
Variable Cost (Rs. in Lakh)								
Raw Fig (Av. Price @ Rs. 150/Kg)	0	63	72	81	81	81	81	81
Sugar @ 32/kg	0	19.15	21.88	24.62	24.62	24.62	24.62	24.62
Other ingredients	0	4.72	5.4	6.07	6.07	6.07	6.07	6.07
Packaging materials	0	8.4	9.6	10.8	10.8	10.8	10.8	10.8
Casual staff salaries	0	5.78	5.78	5.78	5.78	5.78	5.78	5.78
Utilities (Electricity, Fuel)	0	1.66	1.90	2.13	2.14	2.14	2.14	2.14
Repair & maintenance	0	0.7	0.8	0.9	0.9	0.9	0.9	0.9
Miscellaneous expenses	0.5	2	2	2	2	2	2	2
Interest on working capital @ 12%	0	2.99	3.42	4.39	4.39	4.39	4.39	4.39
Total Variable Cost (Rs. in Lakh)	0.5	108.41	122.79	137.71	137.71	137.71	137.71	137.71
Break Even Point (BEP)								
as % of sale	-	12	10	8	8	7	7	6
Break Even Point (BEP) in terms of sales value (Rs. in Lakhs)	-	35.28	33.6	30.24	30.24	26.46	26.46	22.68

2.17 Pie chart for better understanding of expenses of each head:



2.18 Typical Fortified Fig Paste Manufacturing Unit Layout



2.19 Machinery Suppliers

There are many machinery suppliers available within India for fruits based beverage processing machineries and equipment. Some of the suppliers are:

1. Bajaj Process pack Limited, Noida, India
2. Shriyan Enterprises. Mumbai, India
3. Hariom Industries. Rajkot, Gujarat, India

3. Limitations of Model DPR & Guidelines for Entrepreneurs

3.1 Limitations of the DPR

i. This DPR has provided only the basic standard components and methodology to be adopted by an entrepreneur while submitting a proposal under the Formalization of Micro Food Processing Enterprises Scheme of MoFPI.

ii. This DPR is made to provide general methodological structure not for specific entrepreneur/crops/location. Therefore, information on the entrepreneur, forms and structure (proprietorship/partnership/cooperative/ FPC/joint stock company) of business, background of proposed project, location, raw material base/contract sourcing, entrepreneur's own SWOT analysis, market research, rationale of the project for specific location, community advantage/benefit, employment generation etc are not given in detail.

iii. The present DPR is based on certain assumptions on cost, prices, interest, capacity utilization, output recovery rate and so on. However, these assumptions in reality may vary across places, markets and situations; thus the resultant calculations will also change accordingly.

3.2 Guidelines for the Entrepreneurs

- i. The success of any prospective food processing project depends on how closer the assumptions made in the initial stage are with the reality of the targeted market/place/situation. Therefore, the entrepreneurs must do its homework as realistic as possible on the assumed parameters.
- ii. This model DPR must be made more comprehensive by the entrepreneur by including information on the entrepreneur, forms and structure (proprietorship/partnership/cooperative/FPC/joint stock company) of entrepreneur's business, project location, raw material costing base/contract sourcing, detailed market research, comprehensive dehydrated product mix based on demand, rationale of the project for specific location, community advantage/benefit from the project, employment generation, production/availability of the raw materials/crops in the targeted area/clusters and many more relevant aspects for acceptance and approval of the competent authority.
- iii. The entrepreneur must be efficient in managing the strategic, financial, operational, material and marketing aspects of a business. In spite of the assumed parameter being closely realistic, a project may become unsustainable if the entrepreneur does not possess the required efficiency in managing different aspects of the business and respond effectively in changing situations.
- iv. The machineries should be purchased after thorough market research and satisfactory demonstration.

- v. The entrepreneur must ensure uninterrupted quality raw materials' supply and maintain optimum inventory levels for smooth operations management.
- vi. The entrepreneur must possess a strategic look to steer the business in upward trajectory.
- vii. The entrepreneur must maintain optimum (not more or less) inventory, current assets. Selecting optimum source of finance, not too high debt-equity ratio, proper capital budgeting and judicious utilization of surplus profit for expansion is must.
- viii. The entrepreneur must explore prospective markets through extensive research, find innovative marketing strategy, and maintain quality, adjust product mix to demand.
- ix. The entrepreneur must provide required documents on land, financial transaction, balance sheet, further project analysis as required by the competent authority for approval.
- x. The entrepreneur must be hopeful and remain positive in attitude while all situations.



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